Robson Forensic
THE EXPERTS

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Interpreting Vehicle EDR (Black box) Data & Recognizing Errors - Expert Article

ARTICLE

In this article, the automotive engineers at Robson Forensic provide an introduction on the capabilities and limitations of vehicle EDR (black box) data.

History, Fundamentals, and Regulations of EDRs

General Motors began recording collision data to gauge real world performance of airbags and other restraint system components by recording the crash pulse. Later, GM added the ability to store vehicle parameters such as speed prior to the collision. Event data recording is typically handled by the Airbag Control Module (ACM), but in some vehicles data can be stored and retrieved from the Engine Control Module (ECM) or Powertrain Control Module (PCM). In the industry, we generally call them Event Data Recorders (EDR) - the systems concerning the collection, storage, and retrievability of onboard motor vehicle crash event data. Crash Reconstructionists and Police can often retrieve crash and/or pre-crash data with Bosch Corporation's Crash Data Retrieval (CDR) System or manufacture specific software/hardware. Not all vehicles can be downloaded as:

- not all vehicles are compatible (non-supported OEMs, older cars)
- not all crashes trigger the recorder (rear impacts, light crashes)
- some recorders may be damaged, or lose power during a crash event

Check with a Robson Forensic expert or the Bosch Corporation to determine which vehicles can be downloaded. In general, the CDR can access some GM vehicles as old as 1994, Fords from 2001, Toyotas from 2003, Chryslers from 2006, and some Honda, Mazda, Nissan, Volvo, and Volkswagens from 2012. As of Sept. 1, 2014, all new cars, light trucks, vans and SUVs sold in the United States must be equipped with an Event Data Recorder (EDR) in accordance with 49CFR563.

- Tire pressure

Potential Problems with EDR Data

Many reconstructionists prefer to rely on EDR data to provide an unbiased measure of pre-impact actions and impact speeds. However, there are times that EDR information should not be relied upon, or requires in depth interpretation, such as when:

- The EDR data contradicts physical evidence
- The data is out of the common driving range (low or high)
- There is a discontinuity in the data (flat lines, spikes, etc.)
- Events such as multiple impacts, spins, airborne, rollover, or narrow object collisions
- The ownership of the data is disputed or the chain of evidence is suspect

When a vehicle impacts multiple objects, the timing of the recorded events can be flawed or out of sequence, as data is continually overwritten. Impacts that compromise the electrical system may yield bad data. Data in the EDR comes from multiple systems, this data can be out of sync or wrong compared to the Airbag Control Module's timing circuit and accelerometer(s). Newer EDRs may have the ability to record more than one event.

EDR components can corrode over time. Also, data can be overwritten or plain wrong if the download is performed improperly. Collisions and vehicle maneuvers that alter the wheel speed relative to the actual vehicle speed can

pro¬grams utilized by the auto industry. Steven is a member of the Society of Automotive Engineers (SAE), holds a Pennsylvania State Inspection License and has been published on Engineering Test and Analysis Methods on multiple occasions.

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